Attachment B

Research Proposal Template

Roads & Highways Monitoring Committee

Subgroup of the Stormwater Working Group

1. RESEARCH PROPOSAL TITLE

Provide a title that briefly and immediately conveys to the reader the intent of the proposed study.

Roadside Ditch Stormwater BMP studies

2. RESEARCH PROBLEM DESCRIPTION

In one or more paragraphs, provide background to set the context and explain the reason for the research by stating the general problem or need. Be explicit about the significance and scope of the problem. Explain the consequences, if any, of not doing this work.

Roadside ditches can carry significant amounts of untreated stormwater from roads and off-right-of-way sources (such as the yards of private landowners). Ditch stormwater is directly or indirectly discharged to sensitive receiving waters (streams, rivers and lakes). Much of the literature on road stormwater runoff has focused on studies from urban and highway settings; very little study has been done on pollutant loads, the effectiveness of routine maintenance or active treatment of road-side ditch stormwater along secondary roads. King County Roads Maintenance completed a study of road-side ditch BMPs in 2011 (*In-Line Ditch Stormwater Treatment BMP Program Final Report, King County 2011*). While this study showed some positive results in reducing stormwater pollutant concentrations, the study period was too limited to evaluate the effectiveness of these BMPs over time or provide a comparison to the effectiveness of other standard ditch maintenance practices.

This proposal would establish long-term (five year) study ditches. Study options would include:

- Control studies at sites with ditches maintained under routine conditions including:
  - Freshly bucket-ditched sites
  - Undisturbed (vegetated) ditches
- Evaluate the compost-based ditch BMPs over a longer period of time to evaluate maintenance needs
- Evaluate other BMP designs and treatment media

3. RESEARCH OBJECTIVE

Describe in very brief terms how the expected benefits/products of the research will be used and by whom. Indicate which one of the three categories the research proposal targets.

X_Effectiveness ____Source Identification ____Status & Trends

Results would benefit any municipal maintenance organization responsible for road-side maintenance in providing real information on the management of road-side ditches and the cost of long-term maintenance of ditch BMPs

4. LITERATURE SEARCH AND RESEARCH IN PROGRESS SUMMARY

Summarize literature and ongoing research found on the topic. Describe any shortcomings or deficiencies in the current body of research and how this project will address them.

King County, In-Line Ditch Stormwater Treatment BMP Program Final Report, 2011.

Colwell, Shanti et.al. A SURVEY OF DITCHES ALONG COUNTY ROADS FOR THEIR POTENTIAL TO AFFECT STORM RUNOFF WATER QUALITY. Center for Urban Water Resources Management, Department of Civil and Environmental Engineering, University of Washington, July 2000.

St John, Matthias S., and Horner, Richard R. Effects of Road Shoulder Treatments on Highway Runoff Quality and Quantity Washington State Transportation Center (TRAC), University of Washington. July 1997.

An extensive compilation of relevant studies and references may be found at http://www.kingcounty.gov/transportation/kcdot/Roads/Environment/StormwaterMonitoringMitigation/Research.aspx.

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5. Geographic Scope and Urgency of Research

How broadly will the results of this research apply?

_X___Nationally __X_Pacific Northwest ____WA Only ____Eastern WA ____Western WA ____Puget Sound Basin

How quickly will you need the results of this research?

____ASAP ____Within 6 months ____Within 1 year ____Within 2 years __X_Within 5 years ____Ongoing

6. Conceptual Research Approach

Summarize what the proposed research involves. Identify any potential technical, institutional, or political barriers to its implementation.

Establish research ditch project sites with upstream (background) and downstream (treatment) monitoring for flow and collection of samples (flow-weighted composite samples) for long-term monitoring. Project sites will include control ditches, both vegetated and freshly cleaned by bucket-ditching. An initial phase of a ditch study that designed, installed and tested pilot BMPs has already been completed (King County, 2011). This required finding suitable study locations, designing and installing ditch BMPs, developing a monitoring and QA plan. A new study could re-visit some of these project sites or find new sites for monitoring.

Stormwater will be evaluated my measuring stormflow and chemical parameters upstream and downstream in both control ditches and ditches with BMPs. Monitoring will require determining criteria for selecting and monitoring storms that are suitable to this evaluation and representative of typical storm conditions for this area.

7. ESTIMATED COST AND TIMING (Optional)

Identify: 1) The funds required; 2) How long the project will take; and 3) Whether the project depends on another action before it can proceed.

The primary focus of this study would be to evaluate long-term performance with a suggested time-frame of five years to evaluate the life and maintenance costs for BMP stormwater treatments compared to the effectiveness of regular ditch maintenance in minimizing transport of stormwater pollutants. Cost has not yet been determined, but would be heavily dependant on the extent of monitoring required; the number of storms to be targeted, the cost of laboratory tests to be performed and the difficulty of obtaining qualifying samples under the selected storm criteria.

8. CONTACT INFORMATION

Provide specific contact information for the person(s) involved in developing the research proposal.

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